

REMARKS / DISCUSSION OF ISSUES

Claims 1-3, 9, 15-21, 24, 26-56, 58 and 59 are presently pending. Claims 44 and 58 are independent claims.

Unless indicated to the contrary, claims are amended for informal reasons, such as to address typographical errors.

Notice of Non-Compliance

Applicants have reviewed the Notice and have had difficulty determining from the Notice what errors existed in the claims filed in the Rule 111 Response in August, 2007. Particularly, the Notice indicates that claim 42 requires markings on the term 'dornase-alpha'; yet there seems to be no change to this term compared to the claim filed in March, 2007. In particular, this term in claim 42 is reproduced here:

42. (previously presented) The method of claim 41, wherein the enzyme is selected from the group consisting of RNase, DNase, telomerase, ligase, nuclease, ribonuclease; hydrogenase, dehydrogenase, aldase, amidase, aminotransferase, amylase, anhydrase, apyrase, arginase, aspartase, aspariginase, carboxylase, carboxypeptidase, catalase, cellulase, cholinesterase, acetylcholinesterase, deaminase, dextranase, dismutase, elastase, esterase, fumarase, glucosidase, hexokinase, isomerase, invertase, kinase, lactase, lipase, lysozyme, malase, naringinase, oxidase, oxygenase, papain, pectinase, peptidase, pepsin, peroxidase, phosphodiesterase, phosphotase, protease, reductase, transferase, tyrosinase, urase, trypsin, chymotrypsin, hydrolases, isomerases, proteases, ligases and oxidoreductases such as esterases, phosphatases, glycosidases and peptidases, superoxide dismutase, tissue plasminogen activator, renin, adenosine deaminase, alpha-glucocerebrosidase, asparaginase, dornase-alpha, hyaluronidase, elastase, trypsin, thymidine kinase, tryptophan hydroxylase, urokinase, kallikrein, bromelain, cathepsins B, D, G, C, clostripain, endoproteinase Arg C, endoproteinase Asp N, endoproteinase Glu C, endoproteinase Lys C, Factor Xa, proteinase K, subtilisin, thermolysin, acylamino acid releasing enzyme,

Presently, the term dornase-alpha is unchanged from the above, and thus no markings are needed under Rule 121.

Moreover, claim 58, as filed in March, 2007 is reproduced here:

58. (currently amended) In a microanalytical device comprised of a substrate and at least one feature selected from microchannels, microcolumns, and combinations thereof, the improvement which comprises incorporating into said at least one feature and/or onto a surface of the substrate a sol-gel having a biological molecule entrapped therein, wherein the sol-gel has been crushed into particulates having a diameter of from about 10 μ m to about 80 μ m and the particulates have been formed into a bed within the microanalytical device or on the surface of the microanalytical device is in a form selected from the group consisting of a monolithic gel, a thin film, and a fiber.

There are no 'double periods' in the claim. There was, however, a missing period; and Applicants have added same.

Objections to the Claims

The objections to claims 43 and 55 are believed to be moot in view of the present amendments thereto. Withdrawal of these objections is respectfully requested.

Claim Rejections under 35 U.S.C. § 112, ¶ 2

Claims 45 and 56 were rejected as being indefinite under the noted section of the Code. Applicants have amended claim 45 to overcome the issues raised. Thus, the rejection of claim 45 is rendered moot.

Claim 56 further defines that the sol-gel is formed in situ in the microanalytical device. Applicants' attorney believes that there is no issue of indefiniteness as this is merely an embodiment of the present teachings. Moreover, the Office Action does not clearly identify that which is indefinite about this claim. Accordingly, not only is the claim definite within the requirements of the Code, but also the Office Action does not articulate with specificity that which is allegedly unclear.

Rejections Under 35 U.S.C. § 103

1. Claims 1-3,24, 26-27,33-36,41-44,46-55 and 58-59 are rejected under 35 U.S.C. § 103(a) as being obvious in view of *Dunn, et al.* (U.S. Patent 5,200,334); *Lochhead, et al.*

(U.S. Patent 6,039,897); *Anvir, et al.* (U.S. Patent 5,300,564); and *Swedeberg, et al.* (6,240,790).

2. Claims 1,9, 15-21, 28-32,37-40 and 44 are rejected under 35 U.S.C. § 103(a) as being obvious in view of *Dunn, et al.* (U.S. Patent 5,200,334); *Lochhead, et al.* (U.S. Patent 6,039,897); *Anvir, et al.* (U.S. Patent 5,300,564); *Swedeberg, et al.* (6,240,790); and Reetz, et al. (Biotechnology and Bioengineering, Vol. 9:527-534, 1996).

At the outset, Applicants rely at least on the following standard of law as it relates to obviousness. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under § 103. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727; 82 U.S.P.Q.2D 1385 (2007), citing, in part *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

The Court in *KSR* continued: "A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36, 86 S. Ct. 684, 15 L. Ed. 2d 545 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412 (CA6 1964)))."

1. Rejection of claims 1-3,24, 26-27,33-36,41-44,46-55 and 58-59

Claim 44

Claim 44 is drawn to a method of preparing a microanalytical device. The method comprises:

*forming a sol-gel comprising an entrapped biological molecule, **crushing the sol-gel to particulates having a diameter of from about 10 μ m to about 80 μ m, and forming the sol-gel particulates into a bed within the microanalytical device or on the surface of the microanalytical device.***

The Office Action relies on *Dunn, et al.* as the primary reference. While the Office Action provides great detail of what the reference discloses, there is little, if any clarity provided as to how the reference relates to features of the claims, most particularly independent claim 44. To wit, a review of the characterization of *Dunn, et al.* in the Office Action reveals a porous sol-gel material and encapsulated enzymes. Therefore, Applicants respectfully submit that the Office Action fails to articulate a rejection pursuant to MPEP § 706.

The above notwithstanding, Applicants respectfully submit that the applied art fails to disclose at least one feature of claim 44.

The Office Action directs Applicants to *Dunn, et al.* and alleges that because the reference discloses that because encapsulated enzymes are used with increasing frequency as microcatalysts, inter alia; and the encapsulating of the enzymes in a porous glass sol-gel. The Office Action then concedes that the reference to *Dunn, et al.* fails to disclose other features of claim 44, and turns secondary references to attempt to cure the defects of the primary reference.

The Office Action directs Applicants to a column 3, lines 20-24 of *Anvir, et al.* for the disclosure of a sol-gel powder. This portion of *Anvir, et al.* discloses sol-gel glass that can be in any shape suitable for test. One 'shape' listed is a powder. In summary, the reference discloses a sol-gel glass that may be a powder. Claim 44 features *forming a sol-gel comprising an entrapped biological molecule, **crushing the sol-gel to particulates.*** The Office Action leaves it to Applicants to surmise that the powder shape is the same as a particulate. No basis is provided for this implicit assumption of the Office Action, rendering the rejection improper. Moreover, there is no disclosure of the

crushing of the sol-gel to particulates as claimed. As such, the applied art thus fails to disclose at least one feature of claim 44.

Moreover, with no disclosure of the desire or need to entrap a biological molecule in sol-gel found in *Dunn, et al.*, or the need to crush the sol-gel into particulates, the Examiner reaches to *Anvir, et al.* for the disclosure of in the improper combination of references. Notably, the reference to *Dunn, et al.* fails to disclose that the sol-gel comprises an entrapped biological molecule or the crushing of the sol-gel into particulates. The only significant relation of the teaching of *Anvir, et al.* to *Dunn, et al.* is sol-gel. Moreover, two additional references are applied to attempt to cure deficiencies in *Anvir, et al.* and *Dunn, et al.* Respectfully, without claim 44 as a template, Applicants respectfully submit that one skilled in the art would not have found it obvious to combine these references as the Examiner has in order to cobble a rejection. Although reasoning for the combination is provided, Applicants respectfully submit that the four-way combination of references mandates that impermissible hindsight has been applied and that the rejection relies on the distortion caused by hindsight bias and relies upon *ex post* reasoning.

In addition, Applicants respectfully submit that the Office Action has failed to address at least one feature of claim 44. Notably, claim 44 features *forming the sol-gel particulates into a bed within the microanalytical device*. In the filed application, the term 'bed' refers to a preparation using a sol-gel matrix crushed and formed into particles of a defined size and providing additional surface area for reaction. A review of the Office Action does not reveal the alleged disclosure of the bed within a microanalytical device, or elsewhere, for that matter. Accordingly, the Office Action fails to cite with specificity the disclosure in the applied art of at least one feature of claim 44. Therefore, the rejection of claim 44 is improper and should be withdrawn.

For at least the reasons set forth above, Applicants respectfully submit that claim 44 is patentable over the applied art. Moreover, claims 1-3,9, 15-24, 26-43, 45-56, which depend from claim 44 directly or indirectly, are patentable for at least the same reasons.

Claim 58

Claim 58 is drawn to a microanalytical device and features:

*“...incorporating into said at least one feature and/or onto a surface of the substrate a sol-gel having a biological molecule entrapped therein, wherein **the sol-gel has been crushed into particulates** having a diameter of from about 10 μm to about 80 μm and **the particulates have been formed into a bed** within the microanalytical device or on the surface of the microanalytical device.”*

While the Office Action does not specifically relate the alleged disclosure within the applied art of the features of claim 58, Applicants submit that claim 58 includes certain features similar to those of claim 44. These features are not disclosed in the applied art for reasons similar or identical those asserted above in connection with the refutation of the rejection of claim 44. For example, the crushing of the sol-gel and the forming of the sol-gel into a bed is not disclosed in the applied art as discussed above. Moreover, the present rejection improperly relies on hindsight to combine references in the rejection.

For at least the reasons set forth above, Applicants respectfully submit that claim 58 is patentable over the applied art. Moreover, claim 59, which depends from claim 58 is patentable for at least the same reasons.

2. Claims 1,9, 15-21, 28-32,37-40 and 44

The rejection of claims 1, 9, 15-21, 28-32,37-40 and 44 relies on the references addressed above as to claim 44. Moreover, the position in support of the rejection is the same. Therefore, claim 44 is patentable for at least the reasons set forth above. . Moreover, claims 1-3,9, 15-24, 26-43, 45-56, which depend from claim 44 directly or indirectly, are patentable for at least the same reasons.

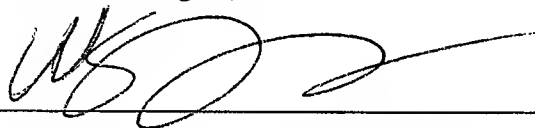
Conclusion

In view the foregoing, applicant(s) respectfully request(s) that the Examiner withdraw the objection(s) and/or rejection(s) of record, allow all the pending claims, and find the application in condition for allowance.

If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted on behalf of:

Agilent Technologies, Inc.

A handwritten signature in black ink, appearing to be 'W. Francos', written over a horizontal line.

by: William S. Francos (Reg. No. 38,456)

Date: December 7, 2007

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